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# A Greco-Latin Numerical List in a St. Gall Fragment

Brandon W. Hawk

**S**T. GALL, STIFTSBIBLIOTHEK, COD. SANG. 1395 contains fourteen groups of manuscript fragments dated between the fifth and tenth centuries, bound together in 1822 by the abbey librarian Ildefons von Arx (1755–1833).<sup>1</sup>

\*I would like to thank the Stiftsbibliothek, St. Gall, for permission to reproduce the manuscript images below. An earlier version of this article was presented at the 42nd Annual Northeast Modern Language Association Convention on April 8, 2011. I would also like to thank Frederick M. Biggs, Lindy Brady, Timothy Graham, Pamela Longo, Paul Russell, and the anonymous reader for *Manuscripta* for input at various stages of this article; any remaining mistakes are my own.

1. Following von Arx's descriptions on the flyleaves of this codex, Gustav Scherrer provides dates and descriptions for the whole collection in *Verzeichniss der Handschriften der Stiftsbibliothek von St. Gallen* (Halle, 1875;

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**Abstract:** This article provides a detailed examination of a manuscript page in St. Gall, Stiftsbibliothek, Cod. Sang. 1395, with special attention given to an unnoticed Greco-Latin numerical list. The main content of the page derives from Bede's *De temporum ratione*, and the fragment offers information about the transmission of this computational text. Furthermore, scribal notes accompanying the list show early medieval uses of Greek learning alongside Latin sources—a phenomenon reflected in a number of other manuscripts from the same time period. Such glosses are also related to the overall trends of Carolingian learning, as well as some possible Insular connections.

**Keywords:** Bede, Carolingian period, computus, *De temporum ratione*, glosses, Greek, Latin, mathematics, paleography, St. Gall Stiftsbibliothek

*Manuscripta* 56.1 (2012) : 28–46 (DOI 10.1484/J.MSS.1.102853)

The eleventh codicological unit of this manuscript (pp. 450–54a) contains a ninth-century glossary of biblical vocabulary written continuously in Latin and Old High German. The Old High German glosses have gained the most scholarly attention: they were printed twice in the nineteenth century;<sup>2</sup> and Rolf Bergmann and Stefanie Stricker provide an extensive discussion of them in their catalogue of Old High German and Old Saxon glosses, recording fifty-four Old High German glosses on the text (see fig. 1, p. 454).<sup>3</sup> The verso of the final extant page of this glossary has, however, gone relatively unnoticed (see fig. 2, p. 454a). About page 454a, Scherrer claims, “Die letzte Seite ist leer, ein paar Federproben ausgenommen” (The last page is blank, except for a few pen trials),<sup>4</sup> but this description overlooks the importance of the page, which reveals associations with the transmission of computus materials on the continent as well as an impulse to supplement Latin sources with attempts at Greek learning.

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repr. Hildesheim, 1975), 461–64; available in electronic form at “Katalog,” *Stiftsbibliothek St. Gallen*, 2006, <http://www.stiftsbibliothek.ch/media/handschriften/index.htm>, accessed May 2011. See also E.A. Lowe, *Codices latini antiquiores: A Palaeographical Guide to Latin Manuscripts Prior to the Ninth Century*, 11 vols. plus supplement (Oxford, 1934–71), 7:no. 984; and description and images at *e-codices: Virtual Manuscript Library of Switzerland*, <http://www.e-codices.unifr.ch>, accessed May 2011. My dates and descriptions of the manuscript are reliant on Scherrer’s work as well as my own examination of images online at the *Virtual Manuscript Library of Switzerland*. I follow the modern pagination, but the numbering for the page under consideration is discussed below. Unless otherwise noted, translations are my own.

2. Eberhard Gottlieb Graff, *Diutiska: Denkmäler deutscher Sprache und Literatur, aus alten Handschriften*, 3 vols. (Stuttgart, 1826–29), 2:378–79; and Heinrich Hattemer, *Denkmale des Mittelalters: St. Gallens altdeutsche Sprachschätze*, 3 vols. (St. Gall, 1844–46), 1:236–37.

3. Rolf Bergmann and Stefanie Stricker, *Katalog der althochdeutschen und altsächsischen Glossenhandschriften*, 6 vols. (Berlin, 2005), 2:no. 256.

4. Scherrer, 464.

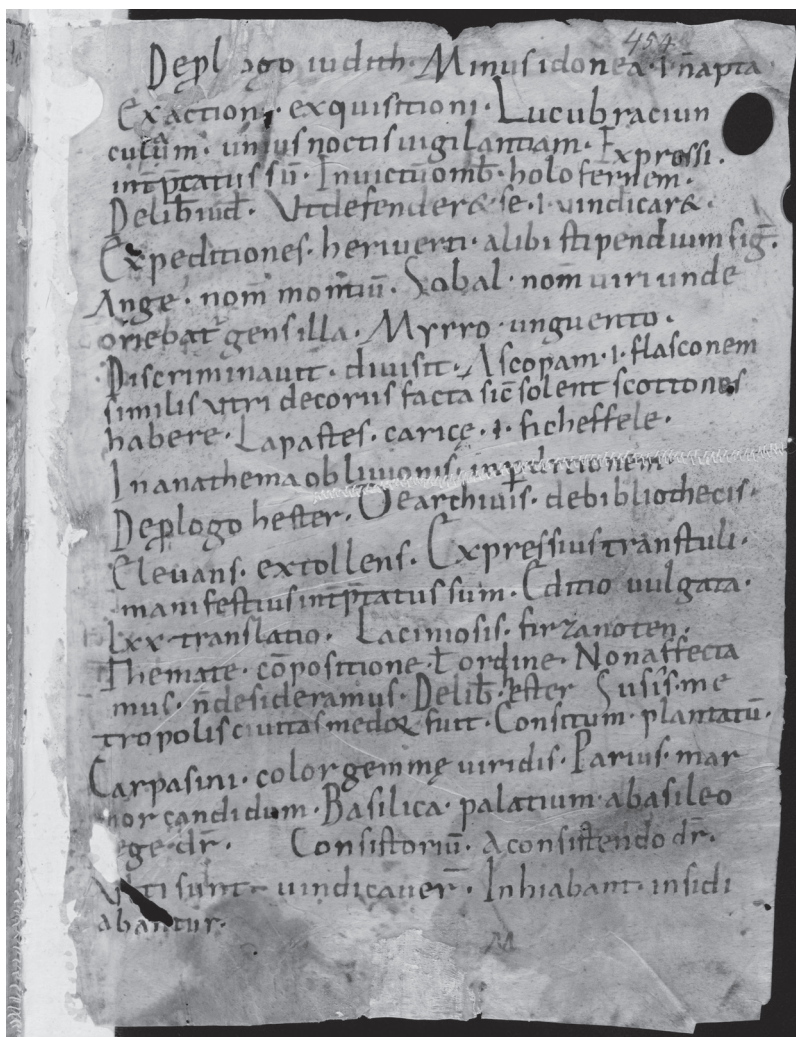


Figure 1.

St. Gall, Stiftsbibliothek, Cod. Sang. 1395, p. 454

Photo: Stiftsbibliothek, St. Gall

(By permission of the Stiftsbibliothek, St. Gall)

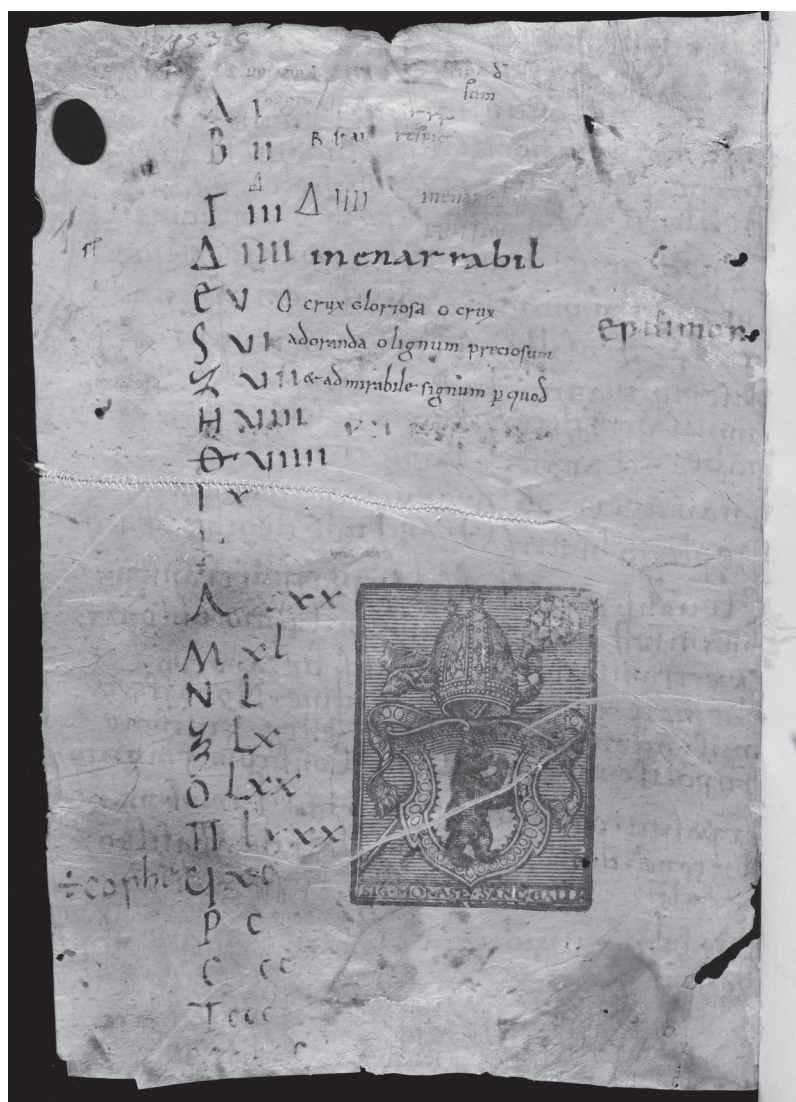


Figure 2.

St. Gall, Stiftsbibliothek, Cod. Sang. 1395, p. 454a

Photo: Stiftsbibliothek, St. Gall

(By permission of the Stiftsbibliothek, St. Gall)

Scherrer, following von Arx, describes the whole of unit eleven as consisting of three leaves, written on “dünnen glatten Pergaments” (thin smooth parchment), measuring 21 by 14–16 centimeters, with 24–27 unruled lines on each page.<sup>5</sup> Page 454a shows signs of wear in several places, and at least the left-hand side and bottom appear to have been trimmed. The most obvious damage is a tear through the middle of the leaf, approximately 11 centimeters in length, which has been stitched back together. In the top left-hand corner, the nineteenth-century page numbering reads “453 c,” although the recto of the same leaf and the following fly-leaf are both numbered 454 (the latter is 454b in the modern foliation). Preceding the glossary (p. 449), von Arx lists the last three pages as “pag. 452.,” “pag. 453.a,” and “p. 43.b. [sic]”—but neither his general description (p. 449) nor his lists of words extracted from the Latin-German glossary (pp. 449–449a) account for the numbering or the contents of the page under examination. Displayed prominently on the bottom center portion of page 454a is a stamp of the monastery bearing the words “SIG[LUM] MONAS[T]E[RII] SANC[TI] GALLI” and the coat of arms of Diethelm Blarer, abbot of St. Gall from 1553 to 1564.<sup>6</sup>

Von Arx and Scherrer date the script of this fragment to the ninth century,<sup>7</sup> and Bergmann and Stricker agree, with the further detail that the script is a “karolingische Minuskel von einer Hand des 9. Jahrhunderts” (Carolingian minuscule in one hand of the ninth century).<sup>8</sup> Yet, despite these claims, the details of the handwriting on page 454a have not been examined. There are at least three scripts, al-

5. Ibid.

6. For the identification of this stamp, see Aaron J. Kleist’s description of St. Gall, Stiftsbibliothek, Cod. Sang. 248 (s.ix, Laon) in the *Virtual Manuscript Library of Switzerland*.

7. Scherrer, 464. At the top of the flyleaf description (p. 449), von Arx titled this unit “Vocabularium Biblicum Saeculi IX.”

8. Bergmann and Stricker, 2:588, no. 256.



though, because the page was used for scribal practice, it is difficult to know whether this is the work of one or up to three or more individual scribes. The first script (A), the largest in size and in the darkest ink on the page, is the same Caroline minuscule as that of the glossary on the preceding pages. Written in this script and running down the left side of the page is the main subject of this study, a list of numerals in their Greek and roman forms.<sup>9</sup> The list is incomplete, only extending through the Greek letter *upsilon* (V) and the corresponding Latin (CCCC); these last letters are slightly rubbed out on the bottom. The word *inenarrabil* (ineffable, though missing the final *-is*) is written in script A to the right of the *delta* (Δ) and *IIII* of the list. In a lighter form of this script, directly above *inenarrabil*, is written *epissimon*, with slight descenders on two tall *s* forms; the same word appears, in the normal aspect of the script, as *epifimon* on the right of the page opposite the *digamma* (f) and VI of the

9. Hereafter, forms of Greek symbols given in parentheses generally correspond to their depictions on the page, often in roman letter forms, not necessarily their correct forms in the Greek alphabet. On the use of the Greek alphabet as numerals in the medieval West, see esp. Richard LeMay, "The Hispanic Origin of Our Present Numeral Forms," *Viator* 8 (1977): 435–77; Dáibhí Ó Cróinín, "Mo-Sinnu moccu Min and the Computus of Bangor," *Peritia* 1 (1982): 281–95; Walter Berschin, *Greek Letters and the Latin Middle Ages: From Jerome to Nicholas of Cusa*, trans. Jerold C. Frakes, rev. ed. (Washington, D.C., 1988), 29–30, and "Greek Elements in Medieval Latin Manuscripts," in *The Sacred Nectar of the Greeks: The Study of Greek in the West in the Early Middle Ages*, ed. Michael W. Herren and Shirley Ann Brown, King's College London Medieval Studies 2 (London, 1988), 85–104; and Bernice M. Kaczynski, *Greek in the Carolingian Age: The St. Gall Manuscripts*, Speculum Anniversary Monographs 13 (Cambridge, Mass., 1988), 33–42. For an overview of medieval Greek and Latin interactions with bibliography, see Bernice M. Kaczynski, "Medieval Translations: Latin and Greek," in *Medieval Latin: An Introduction and Bibliographical Guide*, ed. F.A.C. Mantello and A.G. Rigg (Washington, D.C., 1996; repr. 1999), 718–22.

list. Finally, in the left-hand margin beside the *koppa* (Ϸ) and XC of the list is the annotation ÷ *cophe*.

34 The second script (B) is a more rounded minuscule with thinner strokes and a slight cursive aspect. Distinctive features are extended ascenders and descenders, with notable descenders on long *r*, tall *s*, and *x*; alternation between the capital *G* and minuscule *g*; and ascenders on *d* backsloping with slight curls to the right. In script B, an additional Greek *beta* (Β) appears to the right of the list *beta*, and two Greek *deltas* (Δ) also appear next to the Greek alphabet, but out of their proper places: one between the roman numerals *II* and *III* and another beside the roman numeral *III*, accompanied by the correct corresponding roman numeral (*IIII*). In the center of the page—on the same three lines as the Greek letters *epsilon* (ε), *digamma* (ϝ), and *zeta* (Ζ)—is written the beginning of a medieval prayer used for the Invention and Exaltation of the Cross: “O crux gloriosa o crux | adoranda o lignum preciosum | & admirabile signum p[er] quod.”<sup>10</sup> The phrase “O crux” is also written faintly in the same script in the left margin beside the *digamma*, with the word *gloriosa* scraped out beneath it beside the *zeta*.

The third script (C), written in the lightest ink on the page, is a rounded minuscule similar to the second script in its thin strokes and tendency toward a cursive aspect, but with less exaggerated descenders and distinctive curls to the right on the heads of *s* that connect with the bodies of the letters. Especially in contrast to script B is the lack of accentuated descenders on long *r* and tall *s*, although the descenders are notably minimal even on *p*, which is the only

10. See René Jean Hesbert, ed., *Corpus antiphonalium officii*, 6 vols., *Rerum ecclesiasticarum documenta*, Series maior, Fontes 7–12 (Rome, 1963–79), 4:no. 7266; and discussion by Ritva Jacobson, “The Antiphoner of Campiègne,” in *The Divine Office in the Latin Middle Ages: Methodology and Source Studies, Regional Developments, Hagiography*, ed. Margot E. Fassler and Rebecca A. Baltzer (Oxford, 2000), 147–78 at 171–72.



other visible descender in this script. Written in script C to the right of the added *delta* (beside the third line of the list) is the word *inenarrabili*, a variant on the word written large in script A beside the *delta* of the main list.

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A number of additional stray words, partial words, and letters stand on their own, executed in the various scripts, although most are in script C. For example, a revealing contrast between the scripts is found in the left margin, where the *s* forms of both scripts B and C are written beside each other. Additionally, appearing in the upper middle section of the page are written *de gra* (probably for *deo gratias*) beside the *alpha*, and, further to the right (listed top to bottom) *d*, *sum*, *rrr*, and *respicc*.<sup>11</sup> Other samples also appear, but are largely illegible. All of these stray samples taken together do support Scherrer's claim that this page was used, at least partly, for scribal pen trials. Without more specific dating based on paleographic evidence, the chronological priority and provenance of these scripts is difficult to establish.

Surprisingly, it has not (to my knowledge) been observed that the Greco-Latin numerical list along the left-hand side of the page recreates part of a table in Bede's *De computo uel loquela digitorum*, a work about numerical calculations that comprises chapter one of his computistical treatise *De temporum ratione*.<sup>12</sup> Bede (probably influenced by Isidore)

11. The last letter of this word is possibly an *e*, making it a second-person singular present imperative form of *respicio*.

12. Hereafter *DTR*; references are to Charles W. Jones, ed., *Bedaе Venerabilis Opera, pars VI: Opera didascalica* 2, CCSL 123B (Turnhout, 1977), 268–74; translations are from Faith Wallis, *Bede: The Reckoning of Time*, Translated Texts for Historians 29 (Liverpool, 1999), 9–13. See also Paul Lejay, "Note sur un passage de Bède et sur un système de numération," in *Compte rendu du quatrième congrès scientifique international de catholiques*, Sixième section, Sciences philologiques (Fribourg, 1898), 129–36; Charles W. Jones, *Bedaе Pseudepigrapha: Scientific Writings Falsely Attributed to Bede* (Ithaca, 1939), 20–38, and Charles W. Jones,

explains the usefulness of this list for understanding the manner of conveying numerals according to the Greeks:

36

... qui non, ut Latini, paucis hisdemque geminatis suos numeros solent exprimere literis; uerum toto alphabeti sui caractere in numerorum figuras expenso, tres qui plus sunt numeros notis singulis depingunt, eundem pene numeri figurandi.

(who do not, like the Latins, express numbers by a few letters and their duplicated forms [i.e. roman numerals]; rather, they depict the figures of numbers with individual signs, by means of all the letters of the alphabet, plus three additional numbers).<sup>13</sup>

In Bede's work, the Greco-Latin numerical list follows this explanation. Although Bede's treatise is the earliest known

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ed., *Beda's Opera de temporibus*, Medieval Academy of America Publications 41 (Cambridge, Mass., 1943), 329–31; Eligius Dekkers and Emilius Gaar, *Clavis patrum latinorum*, 3rd ed. (Turnhout, 1995), no. 2320; John J. Machielsen, *Clavis patristica pseudepigraphorum medii aevi*, 5 vols. (Turnhout, 1990–2004), 3A:no. 640B. On Bede's knowledge of Greek, see Jean Gribomont, "Saint Bède et ses dictionnaires grecs," *Revue bénédictine* 89 (1979): 271–80; Anna Carlotta Dionisotti, "On Bede, Grammars and Greek," *Revue bénédictine* 92 (1982): 111–41; Kevin M. Lynch, "The Venerable Bede's Knowledge of Greek," *Traditio* 39 (1983): 432–39; and Berschin, *Greek Letters*, 99–101.

13. Jones, *Beda's Venerabilis*, 272–73, lines 90–95; and Wallis, 11–12. Cf. Wallace M. Lindsay, ed., *Isidori Hispalensis Episcopi Etymologiarum sive originum libri xx*, 2 vols. (Oxford, 1911), 1:iii.10: "Omnes autem litterae apud Graecos et verba componunt et numeros faciunt ... et sic omnes litterae apud eos numeros habent"; and *The Etymologies of Isidore of Seville*, trans. Stephen A. Barney, W.J. Lewis, J.A. Beach, and Oliver Berghof (Cambridge, 2006), 40: "All the letters in Greek compose words and also make numbers ... and so every letter corresponds to a number for the Greeks."

work to include this numerical table,<sup>14</sup> Chapter One of *DTR* does rely on previous similar discussions of computation.<sup>15</sup> Bede's table was widely transmitted,<sup>16</sup> and, in particular, was used by Rabanus Maurus in Book VII (*De Grecorum notis ad numeros aptatis*) of his *Liber de computo*,<sup>17</sup> and in the Anglo-Saxon "Byrhtferth glosses" on Bede's treatise.<sup>18</sup> The list in St. Gall 1395 demonstrates the prevalence of Bede's work, as the scribe of this fragment was certainly familiar with it. While Bede's table includes all twenty-seven Greek figures and their corresponding roman numerals, the list on page 454a contains only the first twenty-two items, as the list ends with the Greek *upsilon* (V), accompanied by the Latin CCCC, and does not include the final five items of the

14. Paul Lejay incorrectly identifies the origin of this passage as Rabanus Maurus's *Liber de computo* in "Note sur un passage"; for corrections to this view, see Jones, *Bedae Opera*, 330; and Ó Cróinín, "Mo-Sinnu moccu Min," 291 n. 1.

15. Jones, *Bedae Pseudepigrapha*, 20–38 and *Bedae Opera*, 329–31; and Wallis, 254–63.

16. See, for example, Greco-Latin tables in various St. Gall manuscripts discussed below; and in works spuriously attributed to Bede in *PL* 90:696, 90:735–36, and 90:741–42. For further references, see Jones, *Bedae Opera*, 331; Berschin, *Greek Letters*, 129; and Wallis, 263. See also, more generally, John J. Contreni, "Bede's Scientific Works in the Carolingian Age," in *Bède le Vénérable: Entre tradition et postérité*, ed. Stéphane Lebecq, Michel Perrin, and Olivier Szerwiniack (Lille, 2005), 247–59.

17. John McCulloh and Wesley M. Stevens, eds., *Rabani Mauri: Martyrologium, Liber de computo*, CCCM 44 (Turnhout, 1979), 213, lines 8–10.

18. *PL* 90:297–518, 90:685–98, and 90:699–702. On these glosses, and the attribution of their composition to Byrhtferth, see especially Charles W. Jones, "The Byrhtferth Glosses," *Medium ævum* 7 (1938): 81–97; Michael Gorman, "The Glosses on Bede's *De temporum ratione* Attributed to Byrhtferth of Ramsey," *Anglo-Saxon England* 25 (1996): 209–32; Michael Lapidge, "Byrhtferth at Work," in *Words and Works: Studies in Medieval English Language and Literature in Honour of Fred C. Robinson*, ed. Peter S. Baker and Nicholas Howe (Toronto, 1998), 25–43 at 43 n. 64; Wallis, xciv–v; Contreni, 252–59; and Michael Lapidge, "Byrhtferth of Ramsey and the *Glossae Bridferti in Bedam*," *The Journal of Medieval Latin* 17 (2007): 384–400.

table; the *kappa* (K) and XX in the middle of the list have also been mostly worn away.

38 The three Latin words *inenarrabil<is>*, *epifimon*, and *cophe* are significant for the ways in which they reflect scribal attempts to understand and supplement Bede's list from other sources. These annotations, however, also reveal that these scribal practices primarily suggest Latinate literacy rather than accurate comprehension of the Greek. The scribe's annotation of the Greek *delta* as *inenarrabil* may be understood as an example of one appropriation of Greek letters into the Latin West. In his discussion of Greek alphabets in Western manuscripts, Walter Berschin observes that the use of *delta* ( $\Delta\Sigma$  and  $\Delta M$ ) to signify the Latin *deus* is "an attempt to use the sacred splendour of Greek letters, enveloping God's name in an aura of even greater holiness."<sup>19</sup> We need not search far for an explanation for the association between *deus* and *inenarrabilis*, since descriptions of God as invisible and ineffable are traditional and common in Christian theology and liturgy.<sup>20</sup> These associations may be traced at least as far back as Irenaeus, since, in the Latin translation of his *Adversus haereses* IV.20,<sup>21</sup> God is described as follows: "[Deus] invisibilis et inenarrabilis est omnibus quae ab eo facta sunt" ([God] is invisible and ineffable to all things which have been made by Him).<sup>22</sup>

19. "Greek Elements," 86; see also David Howlett, "Hellenic Learning in Insular Latin: An Essay on Supported Claims," *Peritia* 12 (1998): 54–78 at 60.

20. See Patrick Sims-Williams, *Religion and Literature in Western England, 600–800*, CSASE 3 (Cambridge, 1990), 315.

21. The Greek is now extant only in fragments: see Maurits Geerard, *Clavis patrum graecorum*, 5 vols. plus supplement (Turnhout, 1974–98), 1:no. 1306.

22. Adelin Rousseau and Louis Doutreleau, eds., *Irénée de Lyon: Contre les heresies*, 2 vols., Sources chrétiennes 100 (Paris, 1965), 2:644, lines 156–57; translation is adapted from Alexander Roberts and James Donaldson, eds., *The Ante-Nicene Fathers*, vol. 1, *The Apostolic Fathers, Justin Martyr, Irenaeus* (New York, 1903, repr. Peabody, Mass., 1994), 489.

A few other examples suffice to demonstrate this tradition in the Latin West. The phrase *deus inenarrabilis* comprises the beginning of the early medieval prayer *Deus inenarrabilis auctor mundi*, composed before the last decades of the eighth century. This prayer appears in liturgies for royal coronation from around 800 onward, such as in the sacramentaries of Gellone (ca. 790–800) and Angoulême (ca. 800), and it was widespread throughout the Middle Ages.<sup>23</sup> The phrase also occurs in a prayer *Deus iustitiae* (often titled *Oratio sancti Augustini*),<sup>24</sup> “widely disseminated on the continent from the ninth century onwards,” in prayerbooks.<sup>25</sup> The association between *deus* and *inenarrabilis* in the ninth century, then, was prevalent, and plausibly explains the annotation of the *delta* in this St. Gall fragment.

The significance of the words *episimon* and *cophe* becomes apparent when compared to Greek numerical signs. The word *epifimon* is a mistaken Latinate form of the Greek word *episemon* (ἐπίσημον), which signifies the *digamma* (also known as *stigma*) and the number six.<sup>26</sup> Because of the similar forms of *f* and *s* in early medieval minuscule scripts, the confusion is not difficult to conceive if this word had been copied from a source but not wholly comprehended by the scribe.<sup>27</sup> For example, as previously described, the scripts of page 454a depict at least three different *s* forms:

23. Richard A. Jackson, ed., *Ordines coronationis Franciae: Texts and Ordines for the Coronation of Frankish and French Kings and Queens in the Middle Ages*, 2 vols. (Philadelphia, 1995), 1:23; for the Sacramentary of Gellone, see 51–54 (esp. no. 2); for the Sacramentary of Angoulême, see 55–65 (esp. nos. 2 and 10).

24. Versions are printed in *PL* 101:598–600 and 101:1384–85; and André Wilmart, ed., *Precum libelli quattuor aevi karolini* (Rome, 1940), 9–10.

25. Patrick Sims-Williams, “Thought, Word, and Deed: An Irish Triad,” *Ériu* 29 (1978): 78–111 at 101–2.

26. The earliest form of the *digamma* is the sign ꝥ or Ꝧ, which was transcribed in Latinate script as *F* or *f*; see Ó Cróinín, “Mo-Sinnu moccu Min,” 290.

27. Cf. the forms *f*, *f*, and *f*.

script A, a long *s* with slight descenders; script B, a long *s* with exaggerated descenders and ascenders; and script C, a long *s* with curls on the heads to the right that connect to the letter bodies. Due to a similar evolution of transcription, *cophe* is a Latinate form of *coppa*, which signifies the Greek letter *koppa* (κόππα) used for the number ninety. This word is more directly indicated as a gloss explanation by use of the ÷, a common shorthand—especially by Insular scribes—often accompanied by a preceding *i* or *id* as an abbreviation for *id est*.<sup>28</sup>

The Latinate glosses to the *digamma* and *koppa* in St. Gall 1395 significantly mark two of the three numerals that Bede singles out as peculiar—just as the scribe marks them as peculiar by annotating them—yet, in *DTR*, Bede himself does not provide the names of the Greek numerals in his table. Glosses on extant versions of this list, however, portray a preoccupation with these Greek symbols, and reveal widespread instances of mistaken Latinate forms. Besides the *digamma* and *koppa*, annotations also show an interest in the third additional Greek symbol, representative of the number 900, which is signified as ↑ and known as *enacosse* (ἐνακόσιαι). The major reason for preoccupations with these three signs is that they originally constituted part of the working Greek alphabet, but by the medieval period

28. See W.M. Lindsay, *Notae Latinae: An Account of Abbreviation in Latin MSS. of the Early Minuscule Period (c. 700–850)* (Cambridge, 1915), 105–9; and Bernhard Bischoff, *Latin Palaeography: Antiquity and the Middle Ages*, trans. Dáibhí Ó Cróinín and David Ganz (Cambridge, 1990), 168. It is probable that *i* or *id* once preceded this symbol but has been lost due to trimming of this page. About this sign, see Lindsay, *Etymologiarum*, l.xxi.5: “Lemniscus, id est, virgula inter geminos punctos iacens, opponitur in his locis, quae sacrae Scripturae interpretes eodem sensu, sed diversis sermonibus transtulerunt”; and Barney et al., *Etymologies*, 50–51: “The *lemniscus*, that is, a horizontal stroke between two points, is put next to those places that translators of Holy Writ have rendered with the same meaning but with different words.”



they had dropped out and were retained only as numerical indicators.<sup>29</sup> For commentators, they thus required explanation, and were often marked as *nota numeri*.

41

Other glosses on Greco-Latin lists provide parallels to those in St. Gall 1395, as well as several points of contact with the preceding examination. In the Laon-Metz gloss commentary on *DTR*,<sup>30</sup> the numerical table is heavily annotated with discussion about the differences between Latin and Greek, as well as the names of the symbols; and in the representative version of this gloss in Berlin, Staatsbibliothek Preußischer Kulturbesitz, MS 130 (Phillipps 1832; ca. 873, Laon), the name *episimon* is given for the *digamma*, and *cosi* is given for the *koppa*.<sup>31</sup> Dáibhí Ó Cróinín has observed interest in these Greek symbols in other manuscripts related to computus materials that lend some insight into the general trend. In an eighth-century Irish fragment in Würzburg, Universitätsbibliothek, MS M.p.th.f.61 (s.viii, Ireland) is a note that comments on these letters, explaining: “f . episinon .i. ui. ., ¶ . cophe uel cosse., xc” (“f ‘episimon’, that is six; ¶ ‘cophe’ or ‘cosse’, [that is] ninety”);<sup>32</sup> as Ó Cróinín observes about the Latinate forms, “the scribe clearly had difficulty understanding his exemplar.”<sup>33</sup> Comparably, the word *cophe* appears beside the symbol for *koppa* in an eleventh-century version of the numerical list in Oxford, Bodleian Library, MS Bodley 309 (s.xi, Vendôme), fol.

29. See Benedict Einarson, “Notes on the Development of the Greek Alphabet,” *Classical Philology* 62 (1967): 1–24, esp. 13; and Lemay, “Hispanic Origin,” 439.

30. For discussions of extant gloss commentaries and their manuscripts, see Jones, *Bedaes Pseudepigrapha*, 20–38 and *Bedaes Venerabilis Opera*, 257–61; Wallis, xciii–vi; and Contreni.

31. Jones, *Bedaes Venerabilis Opera*, 273, notes on lines 99 and 101; and Contreni, 249–50.

32. Edited with apparatus, translation, and folio image in Ó Cróinín, “Mo-Sinnu moccu Min,” 283–85.

33. Ibid., 289.

61v.<sup>34</sup> For these spellings, Ó Cróinín offers the following explanation: “The confusion probably arose from the misreading of *coppe*, where the p’s were of the Irish minuscule type (shaft with s-shaped head).”<sup>35</sup> An alternative explanation is that *cosse* arose due to a shift of transcription from *ph* (*cophe*) to *f* (*coffe*) and a subsequent scribal misreading of these forms as long *s*.<sup>36</sup> This development is further justified by the gloss in the Berlin manuscript, which contains a similar spelling. Berschin also notes the significance of “Greek numerical signs for 6, 90 and 900 ... correctly integrated into the alphabet and marked with *nota* at the edge” in Vienna, Österreichische Nationalbibliothek, MS 795 (ca. 800, Bavaria), fol. 19r, where the *digamma* is annotated as *episinon*, and the *koppa* as *copin*.<sup>37</sup>

Variants parallel to the Latinate misreadings in St. Gall 1395 also exist in Greco-Latin numerical lists of other ninth-century manuscripts that survive in the St. Gall Stiftsbibliothek:<sup>38</sup> for example, Latinate annotations on *digamma* are given as *episimon*,<sup>39</sup> *episinon*,<sup>40</sup> and a garbled *erisen* (due to confusion of Insular *r* and *p*);<sup>41</sup> and annotations on *koppa* are

34. Ibid., 292

35. Ibid., 290 n. 1.

36. Thanks to Paul Russell for discussing this issue with me.

37. Berschin, “Greek Elements,” 88–89; see also Berschin, *Greek Letters*, 29 and 128; for images, see Plate 2 in Herren, *Sacred Nectar*; and Plate 2 in Berschin, *Greek Letters*.

38. While not all of these manuscripts were produced at St. Gall, they do portray contemporary continental traditions. In the following references, at the first instance of citation for each manuscript, date and provenance are provided. For descriptions, see Scherrer; “Appendix 1” in Kaczynski, *Greek in the Carolingian Age*, 117–20; and descriptions and images online in the *Virtual Manuscript Library of Switzerland*.

39. Cod. Sang. 248 (s.ix, Laon), p. 102; Cod. Sang. 250 (s.ix, St. Gall), p. 172; Cod. Sang. 251 (s.ix, St. Gall), p. 48; and Cod. Sang. 459 (s.ix/x, St. Gall), p. 111.

40. Cod. Sang. 671 (s.ix, St. Gall), p. 207.

41. Cod. Sang. 877 (s.ix, St. Gall), p. 63.

given as *cophin* (with an added *-e* above the *-in*),<sup>42</sup> *cophe*,<sup>43</sup> *cofe*,<sup>44</sup> and *kofe*.<sup>45</sup> Further signaling the peculiarities of such numerals and lists, glosses for *digamma* and *koppa* are conspicuously absent in some of these lists of Greek symbols and their names;<sup>46</sup> while both *digamma* and *koppa* are often glossed as *nota* or *nota numeri*.<sup>47</sup>

Kaczynski also notes the trend of “charts and tables reflecting a more independent interest in the alphabet,” many of which contain names for the Greek symbols.<sup>48</sup> Furthermore, the practical uses of such a table extend beyond computistical and numerical knowledge, such as facilitating accurate transcriptions of Greek materials foreign to scribes.<sup>49</sup> This point should not go unnoticed, since these numerical tables work as resources to teach the foundations not only of computistical calculations but also of connections between the two languages.<sup>50</sup> Extended study of Greek alphabetical and numerical lists in Western manuscripts would undoubtedly yield more results of this type, as would devoting more attention to Greek elements that would otherwise be dismissed.

Variations in Latinate spellings and forms of Greek symbols are also not uncommon in the broader range of medieval manuscripts. After all, even the most competent scribes who encountered Greek may not have known the language or alphabet; copying texts in this language thus

42. Cod. Sang. 251, p. 48.

43. Cod. Sang. 877, p. 63.

44. Cod. Sang. 248, p. 102; Cod. Sang. 250, p. 172; and Cod. Sang. 459, p. 111.

45. Cod. Sang. 671, p. 207.

46. Cod. Sang. 397 (s.ix, St. Gall), pp. 25 and 78; Cod. Sang. 876 (s.viii/ix, St. Gall), pp. 278-79; and Cod. Sang. 878 (c.825x829, Reichenau), p. 321.

47. Cod. Sang. 397, p. 78; Cod. Sang. 671, p. 207; Cod. Sang. 876, pp. 278-79; and Cod. Sang. 877, p. 63.

48. Kaczynski, *Greek in the Carolingian Age*, 36 and 38.

49. Berschin, “Greek Elements,” 89.

50. Berschin, *Greek Letters*, 29-30.

presented special challenges, and some scribes could expect to imitate letter forms only in approximations. Instances in the manuscripts discussed above also reflect related tendencies of Latin transliteration in which the aural aspects of Greek were preserved rather than the letter forms. Furthermore, the process of recopying also admitted scribal transformations across manuscripts.<sup>51</sup> Yet these instances reflect an awareness of and striving toward appropriating widespread learning in the liberal arts. Indeed, contemporary glosses on *DTR* portray fresh Carolingian approaches to computi within educational reforms.<sup>52</sup> The ninth-century examples of Greco-Latin numerical tables and their annotations depict such scholarship, as scribes strove to transmit the learning of the past. Not coincidentally, in several of these manuscripts, the Greco-Latin tables are often depicted alongside various computus materials, even alongside *DTR* itself.<sup>53</sup> At the same time, these numerical lists—including the one in St. Gall 1395—also portray a wider learned tradition drawing on sources beyond Bede's own work.

A number of characteristics on this page also point to possible Insular affiliations. First, most specifically, paleographical abbreviations for *est* (÷) and *per* (with a cross-stroke through the descender) are particularly characteristic of Insular practices, and both are evident in Insular-influenced Continental scripts by the ninth century.<sup>54</sup> More broadly, computus traditions have strong associations with early Irish and English learning, as computi developed largely out of the Paschal controversy between the two

51. See Kaczynski, *Greek in the Carolingian Age*, 28–29.

52. See Wallis, lxxxviii–xcvi.

53. See summaries of the manuscripts in Kaczynski, *Greek in the Carolingian Age*, 117–20; and descriptions and images online in the *Virtual Manuscript Library of Switzerland*.

54. See Lindsay, *Notae Latinae*, 105–9 and 175–82; and Bischoff, 160 and 168.

churches. Charles W. Jones has demonstrated that computational knowledge and skills were mediated to much of the West by Irish scribes, and many computus materials originate in Ireland or portray Irish influences.<sup>55</sup> There was, in fact, much intertextuality between Bede and Irish computational traditions, as he drew on previous Irish computi for his work, as did later computists who also, in turn, drew on Bede. Furthermore, some of the manuscripts with analogous annotations to Greco-Latin lists also portray Insular influences, indicating a common milieu for this type of learning. Such possible associations are not surprising given the long-standing Irish traditions at St. Gall in the Middle Ages, and they may indeed have some bearing on the contents of page 454a.<sup>56</sup> Nonetheless, without further evidence, these observations remain tentative.

55. See esp. Jones, "The 'Lost' Sirmond Manuscript of Bede's 'Computus,'" *English Historical Review* 52 (1937), 204–19, *Beda's Pseudepigrapha*, and *Beda's Opera*; Dáibhí Ó Cróinín, "The Irish Provenance of Bede's Computus," *Peritia* 2 (1983), 229–47; and Wallis.

56. Several other codicological units in St. Gall 1395, in fact, bear out Irish associations with St. Gall: unit six (pp. 418–27, s.viii) contains Irish illuminations and an Old Irish text; units seven (pp. 430–33; s.vii), eight (pp. 436–37; s.viii), nine (pp. 440–41; s.ix), and ten (pp. 444–47; s.ix) are written in scripts identified as Irish minuscule and cursive. For further descriptions, see Scherrer, 461–64; and the *Virtual Manuscript Library of Switzerland*. On the Irish associations with St. Gall more generally (with references to fragments in St. Gall 1395), see esp. J.M. Clark, *The Abbey of St Gall as a Centre of Literature and Art* (Cambridge, 1926); W. Reeves and Ferdinand Keller, "Early Irish Calligraphy," *Ulster Journal of Archaeology* 8 (1960): 210–30 and 291–308; James F. Kenney, *The Sources for the Early History of Ireland: Ecclesiastical, An Introduction and Guide*, Records of Civilization 11 (New York, 1966), esp. 594–600; Johannes Duft, "Irische Handschriftenüberlieferung in St. Gallen," in *Die Iren und Europa im früheren Mittelalter*, ed. Heinz Lowe, 2 vols. (Stuttgart, 1982), 2:916–37, and "Irish Monks and Irish Manuscripts in St. Gall," in *The Culture of the Abbey of St. Gall: An Overview*, ed. James C. King and Werner Vogler (Stuttgart, 1991), 119–32, with more specific references there.

What may be gleaned from the preceding examination, then, is that page 454a of St. Gall 1395 fits into more general practices of textual transmissions and learned culture than has been previously acknowledged. The issues at hand are thus threefold: first, the transmission of Bede's table of Greco-Latin numerals; second, the situation of this page among widespread cultural contexts of computus traditions in the ninth century; and, third, the scribal impulse to incorporate and transmit Greek learning alongside such texts. All three of these issues point toward the complexity of interactions and the pervasiveness of scribal borrowings from an array of sources in medieval Europe. Even a single page like 454a does much to promote further confirmation that scholarship was not stale in the early Middle Ages. When considering what may be seemingly unimportant *Federproben* as those on page 454a, there is a need to avoid dismissing substantial evidence for medieval learning that sits at the foundations of scribal culture.

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